

IDENTIFYING THE IMPACTS OF PHASE II OF THE MALL OF AMERICA
ON THE BLOOMINGTON, MINNESOTA FIRE DEPARTMENT

EXECUTIVE DEVELOPMENT

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ABSTRACT

The problem investigated was the Bloomington Fire Department (BFD) had not identified the impact on fire department operations from the Mall of America (MOA) Expansion. The purpose was to identify needed improvements to BFD operations relative to the MOA expansion. Research questions included:

1. What are the capabilities of other fire departments with large malls?
2. What are fire operations plans for similar sized malls?
3. Where are the potential locations for equipment cache(s)?
4. What recommendations will be implemented to improve BFD fire operations?

Descriptive research methods included the review of fire departments in North America, an interview, and literature review. The results indicated the importance of needed improvements and recommendations for BFD operations related to the MOA expansion.

CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writing of another.

Signed:_____

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Introduction

This section will define the problem and purpose of this research project. The specific research methods and research questions will also be outlined in this section.

Bloomington, Minnesota is home to one of the largest indoor malls in America. With 4.2 million square feet of retail and entertainment space under one roof the Mall of America (MOA) has become one of the largest tourist destinations in the United States. Conceptual plans for Phase II of the MOA have been approved and construction may start as early as 2008. The Development plan for the MOA Phase II depicts a 5.6 million foot integrated, mixed-use center consisting of hotel, office, residential and entertainment uses. Included in the plans are three hotels, one of which will include an indoor water park, theatres, a town center, recreational anchor, and offices. Phase II will be connected on the north side of the current Mall. (KKe Architects, 2006).

The problem is the MOA is planning a major expansion and the Bloomington Fire Department (BFD) has yet to identify the impact of this expansion on its operations, which could result in an increased risk to life and property.

The purpose of this applied research is to identify and provide through descriptive research needed improvements to BFD operations relative to the Mall of America expansion. The questions to be answered by this research are:

1. What are the capabilities of fire departments with similar sized shopping malls?
2. What are fire operations plans for similar sized shopping malls by fire departments?
3. Where are the potential locations for equipment cache(s) within the mall?

4. What recommendations will be implemented to improve the BFD fire operations due to the MOA expansion?

Procedures for this paper included literature research which began at the National Fire Academy (NFA) and continued on the internet. Past and present BFD operations at the MOA were reviewed, described, and critiqued. Operations from other departments with similar sized malls were also reviewed and also critiqued.

Background and Significance

The City of Bloomington

Bloomington, Minnesota, a southern suburb of Minneapolis was founded in 1858. Today, Bloomington has grown into a dynamic city with more than 85,000 residents and a daytime work population of over 100,000 people. Major industries include retail and entertainment, hotel and restaurant, health maintenance and computer manufacturing. Bloomington's border includes the Minneapolis-St Paul International (MSP) Airport and the Minnesota River as the southern boundary. The City of Bloomington includes a working full-time staff of over 500 employees (City of Bloomington, n.d.). The Mall of America is located within Bloomington city limits, just south of the MSP Airport.

Bloomington's fire protection is provided by the BFD which consists of one full-time fire chief and approximately 150 paid on-call firefighters. The BFD operates out of six fire stations with nine engine companies, five ladder companies, and several additional support vehicles. The BFD operates on a budget of approximately \$2.5 million per year and has an average call load of

approximately 1,200 calls per year (Bloomington Fire Department, 2006). The BFD provides back-up emergency medical services for the Bloomington Police Department. Thus, the primary response from BFD consists of non-medical emergency response including fire, hazmat, and rescue related calls.

The Mall of America (MOA)

The MOA opened its doors in August of 1992 with a price tag of \$650 million. With a total of 4.2 million square feet and 2.5 million square feet of gross leasable space, it makes the MOA the largest shopping mall in the United States. The MOA contains more than 520 stores, 20 sit-down restaurants, 30 fast food restaurants, 36 specialty food stores, and 14 movie screens. The MOA employs 11,000 year-round employees which often peaks to 13,000 employees in the summer and holiday months. Key attractions include an indoor amusement park, an underwater aquarium, LEGO imagination center and four large anchor stores. The MOA is also home to the southern most stop of the light rail transit line that runs north from Bloomington to the MSP Airport with the final destination located in downtown Minneapolis. The MOA has become the largest tourist attraction in Minnesota. (Mall of America, n.d.)

Mall of America Phase II Expansion

Phase II of the MOA will include an additional 5.6 million square feet of space, on 42 acres, for an integrated, mixed-use center consisting of retail, hotel, office, residential, and entertainment uses. Included in the preliminary development plans are three hotels, one of which

will include a large indoor water park, theaters, a town center, recreational anchor, offices, and residential. Plans also call for the roadway, Lindau Lane to be a tunnel that will run underneath Phase II. A large parking structure would also be constructed which would include 6,500 additional parking spaces bringing the total parking spaces between MOA and Phase II to 20,400. Also included in the plans is a power plant to supply power to the entire complex (KKe Architects, 2006).

Phase II will offer several hotels, one of which will include a large indoor water park. The plans also call for a recreational water way to flow through the center of the space where kayakers can take on the rapids as shoppers watch. In addition, a 54,000 square foot ice hockey facility will be built, a 152,000 square foot performing arts center, and a large 300,000 square foot recreational anchor store on the north end of the complex. An additional 1 million square feet of retail shops will be included along with two large office buildings totaling 615,000 square feet. The entertainment will include a 62,000 square foot dinner theatre, a 69,000 square foot cinema, and a 34,000 square foot museum. The total hotel space will include three large hotels with a total of 1,250 rooms for visitors and shoppers to spend time overnight making the MOA and Phase II a 24-hour operation (KKe Architects, 2006).

Phase II will include 100,000 square feet of food courts and sit down restaurants. The mall common area will take up 787,000 square feet with 380,000 square feet of service corridors and lower level corridors (KKe Architects, 2006).

The IKEA store, which is the first structure of Phase II to have been completed, occupies 330,000 square feet and provides 1,400 parking spaces in a large parking ramp which runs underneath the store. Once Phase II is complete, the total number of parking spaces between the current Mall and Phase II will jump to 20,400. Two parking ramps will be included in the

development of Phase II, with the east ramp containing 5,242 parking spaces and the northwest ramp totaling 1,260 spaces. There will also be 450 underground vehicle parking spaces (Mall of America, n.d.)

Phase II is expected to generate jobs, provide revenue to the city and state and bring more tourists to Minnesota. A recent article in the Sun Current Newspaper stated, “according to mall officials, Phase II will generate more than 7,000 construction jobs, \$800 million in construction wages, 20 million additional tourists annually, 7,000 permanent jobs, and \$1 billion in new tax revenue over the first 20 years” (Rockwood, H. T., 2008, p.11A).

Potential Impact of MOA Phase II on BFD

With a proposed project this large, in conjunction with the current MOA it will no doubt impact the BFD. Currently, the MOA has been manageable for the BFD in regards to response and training but significant changes in response were noted when the current structure opened in 1992. The BFD has averaged approximately 36 calls to the MOA per year ranging from elevator emergencies to car fires in the parking ramps. Since 1992 several fires have occurred in the MOA structure itself which for the most part were contained to the area of origin by the fire suppression system. Thus far, the biggest challenge for BFD has been the amusement park where several ride malfunctions have entrapped riders.

When the MOA opened in 1992 it brought changes to the operations of the BFD. Fighting car fires in the two large parking ramps required the purchase of a special mini pumper which is able to maneuver in the height-restricted ramps where a standard fire engine would not fit. Additionally, standpipes in the ramps provide a water supply and back-up system if the mini

pumper was out of service or unable to reach the fire. Since the MOA opened in 1992 the mini pumper has proven beneficial as it has extinguished numerous car fires.

Once the MOA opened its indoor amusement park, it required the BFD to be proactive in its training when dealing with amusement rides and potential terrorist attacks. Other changes to the BFD involved equipment purchases. The Department has decided to purchase larger pumps for newly purchased engines. The BFD went from purchasing 1,250 GPM pumps for their fire engines to 1,500 GPM pumps and most recently changed to 2,000 GPM pumps on all of its new engines. These upgrades in pump size were done to backup the MOA's fire suppression system and provide the ability to deliver larger volumes of water to this structure.

Adding another 5.6 million square feet of space to the current building will have additional impacts on BFD operations although those impacts are continuing to be identified. The BFD recognizes Phase II will have an impact, but has been unable to identify the specific impacts sufficiently and subsequently does not fully understand the potential consequences and risks that could be placed on the community. The MOA provides the City of Bloomington and the State of Minnesota millions of dollars in revenue from shoppers and tourists staying in local hotels. Any incident at the MOA could potentially cause a major loss of life or an economic disaster not only to the city but to the entire state. It will be important for the BFD to identify the impact of the Phase II and identify the necessary changes to its operations before Phase II is complete.

The United States Fire Administration (2007) provides the following five items as operational objectives:

1. Reduce the loss of life from fire in the age group 14 years old and below.
2. Reduce the loss of life from fire in the age group 65 years old and above.

3. Reduce the loss of life from fire of firefighters.
4. To promote within communities a comprehensive, multi-hazard risk-reduction plan led by the fire service organization.
5. To respond appropriately in a timely manner to emerging issues.

The completion of the research project addresses the stated United States Fire Administration [USFA] operation objectives found in 4 and 5 above. The relationship of this research paper and the Executive Development course includes leadership, research, and change by identifying the problem BFD faces with the expansion of the MOA with Phase II.

This Executive Fire Officer Program research paper relates to the USFA mission “to reduce life and economic losses due to fire and related emergencies, through leadership, advocacy, coordination and support” (USFA, 2005) by identifying and solving a potential problem within the City of Bloomington which could result in an increased risk to life and property.

Literature Review

Developing a plan on how MOA Phase II will impact the BFD required extensive research on fire departments around the United States and Canada who respond to large shopping malls. The research also included how these malls have impacted the different departments, their operations and specific response to these large shopping malls. Finally, the literature provided in this paper will explain the need for change within the BFD regarding how they respond to the MOA when Phase II is complete. The research will also demonstrate the need and importance of this plan. A variety of fire service books and journals were used as reference materials as well as

materials from different departments around the United States and Canada. Materials from the Learning Resource Center at the National Fire Academy were also used.

Applied research papers from the Executive Fire Officer Program of the National Fire Academy are limited on the topic of fire protection in large shopping malls. Some papers are available but do not address how the malls impacted their fire department operations nor do they cover a mall as large as the MOA Phase II.

In researching the impacts and response plans of fire departments across the country it was found that these departments either did not project what impact these malls would have on their operations or had very limited if any specific response plans to their mall. Understanding the impacts and developing plans are affected by the fire department's ability to recognize and address the response issues.

This author's research is centered on the MOA which is considered a "megamall" and one of the largest malls in North America. It was difficult to compare this mall to others across the country but not impossible. Several malls in the United States and Canada are similar in size to the existing MOA although none are planning an expansion as large as Phase II.

Even though large shopping malls have been in existence for many years, it was surprising that many departments have not developed a specific plan for their mall. With the potential for a significant incident involving one of these malls, there is evidence that if an incident were to take place, it would result in an increased risk to life and property. An all hazard incident in an enclosed shopping mall will challenge any fire department. Some have called the covered mall a 'horizontal high rise'; "Multiwinged structures with long, large, open corridors, hundreds of storefronts, many locked gates, and the possible evacuation of thousands of shoppers are problems that first-arriving units may encounter" (Lombardo, Pressler, 1993, p. 71).

In October 2004 the Trago Mills fire took place in Devon, England involving a large 100 acre shopping mall. More than 200 firefighters tackled the blaze before it gutted nearly a third of the structure. The fire shut the mall down for twelve weeks as it was rebuilt costing the area millions in revenue. The Trago Mills Fire illustrates how important it is to have a plan for large shopping malls. The Devon Fire Department relied on fire safety measures already in place to help control this incident. The proactive planning likely brought a better conclusion to this incident. In the article, Slaven (2004) reports “CFO Paul Young, who took command of the incident, said the blaze was “the most severe in Devon for some time” (p. 13). The blaze was one of the worst these firefighters have seen who worked in extreme temperatures and battled heavy thick smoke. CFO Young went on to say, “We were pleased with the operation and the fact we saved a significant part of the building. Without the fire precautions and the response the whole building may have been lost” (Slaven, 2004, p. 13).

In the article *Firefighting Operations in Enclosed Malls* Smith (1999, p. 18) states “The ability of a fire department to respond effectively into parking lots that virtually are jammed with cars will be the first hurdle”. Pre-incident planning and accurate information from dispatch will be important in helping control any incident within the mall with the first tactic always considering life safety. Stores that occupy malls can range from restaurants to auto parts stores with the potential for high fire load involving plastics and linens that could produce heavy smoke conditions very quickly (Smith, 1999). A proactive plan and good training will help bring a successful ending to these types of incidents.

In researching this project this author found reference material but additionally sought first hand knowledge by directly contacting several departments across North America to gain insight on specific malls and their impact on the local fire departments.

The King of Prussia Mall in Philadelphia, Pennsylvania has sought to establish its place among one of the largest shopping malls in the United States with an expansion and merger of three adjacent malls. It has been promoted as the largest shopping complex on the East Coast (Eastern Connecticut State University, 2006). King of Prussia Volunteer Fire Company in Montgomery County, Pennsylvania is a department that is part of the Montgomery County Fire District and provides protection to the King of Prussia Mall. The King of Prussia Volunteer Fire Company consists of approximately 95 volunteer firefighters who respond out of one fire station. King of Prussia Volunteer Fire Company receives mutual aid from within the Montgomery County Fire District. In the late 1980's the King of Prussia Volunteer Fire Company responded to a large fire at the King of Prussia Mall; 80,000 square feet of roof caught fire causing extensive damage (King of Prussia Volunteer Fire Company, n.d.). When this author contacted the King of Prussia Volunteer Fire Company representative, it was very difficult to receive any specific information on how the mall has impacted their department or specific plans as the representative cited security reasons.

The Roosevelt Field Mall in Garden City New York is the largest shopping mall in New York with 2.1 million square feet of leasable area. The mall consists of 270 stores with four large anchor stores, many specialty stores and restaurants (Simon Malls, n.d.). The Westbury Fire Department protects the Roosevelt Field Mall. The Westbury Fire Department consists of 150 firefighters who operate out of one fire station. They respond to approximately 1,500 calls a year but were unable to indicate how many of those calls are to the Roosevelt Field Mall (Westbury F.D., n.d.). After several attempts at contacting a representative from Westbury Fire Department this author was unable to obtain any information as the Westbury Fire Department concluded their information related to the Roosevelt Field Mall was outdated and needed to be updated.

Sunrise, Florida located in the Miami-Dade Palm Beach area is the home to Sawgrass Mall, a mall with 2.5 million square feet of gross leasable space (Eastern Connecticut University, 2006). This mall's fire protection is provided by the Sunrise Fire Department. The Sunrise Fire Department a fulltime fire department that operates out of five fire stations and responds to approximately 12,000 emergency calls per year (City of Sunrise, n.d.). Chief Dixon of the Sunrise Fire Department provided information on the Sunrise Fire Department and how the Sawgrass Mall has impacted its operations and specific plans or general guidelines/procedures. The Sunrise Fire Department has the most in-depth plan for their mall that this author could find. It includes a response plan to the anchor stores as well as the entire mall itself. The plan distinguishes the responses between the mall and the anchor stores. It also includes specific rig assignments depending on the type of call. For example, the Sunrise Fire Department sends a single engine to a confirmed false alarm but a full alarm response to a fire alarm. A "working fire" at the mall is an automatic 2nd alarm fire. The plan also includes tactical considerations including offensive and defensive operations, a communications plan, and most importantly fire scenario objectives. The priorities are: Minimize life endangerment by evacuating occupants. Locate, confine and extinguish the fire and keep property damage to a minimum (City of Sunrise, n.d.).

The most significant impact from the Sawgrass Mall on the Sunrise Fire Department is emergency medical services. The Sunrise Fire Department provides ALS services with the majority of its runs to the Sawgrass Mall consisting of medicals.

The Galleria shopping mall in Houston, Texas has 2.3 million square feet of gross leaseable area and is protected by the Houston Fire Department (Eastern Connecticut University, 2006). Chief Carl Matejka, Houston Fire Department provided the plan that his fire department

uses when responding to this complex. It includes a “Tactical Evaluation Action Plan” which is a document that has basic information on standpipes, sprinklers and any unusual hazards. The high-rise portion of the mall also includes a “high-rise survey” (Houston Fire Department, n.d.). The Houston Fire Department does not store any equipment in the mall or surrounding high rises. The impact from the Galleria shopping mall on the Houston Fire Department is relatively minimal. The Houston Fire Department operates out of 90 fire stations with approximately 3,700 firefighters and 273 support staff. The 2007 Houston Fire Department Budget is \$363 million (Houston Fire Department, n.d.).

The West Edmonton Mall located in Edmonton, Alberta, is often referred to as the 8th wonder of the world, and is considered the largest mall in North America (West Edmonton Mall, n.d.). The mall spans the equivalent of 48 square city blocks and includes over 800 stores, 100 eating establishments, a world class hotel, an ice skating rink, and an indoor water park. This mall and the MOA were developed and are currently managed by the same owners. Phase II is also being developed by the same owners. The City of Edmonton Fire Department provides EMS and fire protection to the mall (West Edmonton Mall, n.d.).

In contacting the Edmonton Fire Department this author conducted an interview with Fire Inspector Dennis Brittle of the Edmonton Fire Department. The interview took place over the phone.

As the West Edmonton Mall is so similar to the MOA and Phase II, this author believes the information provided by Inspector Brittle is most valuable. Inspector Brittle detailed the structure of the Edmonton Fire Department, which consists of 900 firefighters that operate out of 25 stations. The Edmonton Fire Department works hand in hand with the division of Emergency Medical Services (EMS). While the EMS division is a separate department the EMS rigs and

personnel operate out of the same fire stations as the Edmonton Fire Department. The Edmonton Fire Department provides all hazard incident response to the West Edmonton Mall.

Inspector Brittle explained the mall itself is protected by thirteen different sprinkler systems with several fire pumps. In the past two years the mall has experienced five fires which were contained by the sprinkler system. The most recent fire damaged an electrical system and produced a heavy amount of smoke. Inspector Brittle, stated the West Edmonton Mall has not produced a huge impact on the fire department or its operations. The mall is within twelve blocks of three Edmonton fire stations.

Edmonton Fire Department does not store any equipment cache within the mall although it has changed its normal response to structures when responding to the mall. When a call is received to the West Edmonton Mall it requires the response of three engines, one ladder, one heavy rescue, and one chief officer. If the call is located in the hotel portion of the mall the response is upgraded to include an additional two ladder companies.

Inspector Brittle did state the most challenging aspect of the West Edmonton Mall has been the inspections portion and getting the mall itself to comply with orders. He also stated the hotel portion of the mall produces a 24-hour operation to a portion of the mall with no down time. This is currently not an issue at the MOA but with Phase II several hotels are planned with the possibility of including residential units which would have an impact on BFD operations.

When researching this paper it became evident that the BFD is in a unique situation with the MOA and planned development of Phase II. This author could not find any fire department in a similar situation as that of the BFD. The fact that the MOA is being served by a paid on-call fire department presents some of its own challenges. In an attempt to find more research this author looked at overall development and the impacts on local fire departments.

McKinney, Texas is located in the central part of Texas and has experienced growth in population and in development. The local fire department, McKinney Fire Department is made up of 146 fulltime firefighters who operate out of six fire stations with an additional station to be added in the near future. The McKinney Fire Department provides service to 60.5 square miles within the city limits and in additional 116 square miles of unincorporated areas of Collin County. A development called “Trinity Falls” is being built within their response area and will have significant impacts on the McKinney Fire Department (City of McKinney, 2006).

A report called “Trinity Falls” was completed by the McKinney Fire Department in 2006 which described the impacts of the development on the fire department. Once this development is completed it will include hundreds of residential and retail properties. This would obviously have an impact on any department. The report states “This development will negatively impact the delivery of fire and EMS services within the city limits of McKinney” (City of McKinney, 2006, ¶1). Results will include longer response times and could have major impact on delivery of services for the city of McKinney if more than one call occurs at the same time. The report also indicated the developer is willing to provide some funding for a 20,000 square foot fire station and would only contribute \$1 million in funding towards the project. The McKinney Fire Department estimates that \$1 million in funding would only provide four to five thousand square feet of space which is inadequate for their fire station needs. Other negative impacts would include the increase in calls, depletion of staffing to protect the rest of the response area, increased response times for the entire area, and more wear and tear on fire department equipment (City of McKinney, 2006).

This author was able to find additional fire departments being impacted by development that are unable to provide an adequate service. This impact included response issues and

problems with meeting national standards for response and response time. The City of Kalispell, Montana Fire Department addresses national response standards due to the growth in the city. In his Executive Fire Officer (EFO) research paper, Brodehl (2004) researched fire station locations, planning, standards, and response times. The City of Kalispell was developing rapidly and the fire department is no longer able to provide adequate response. The research found the Kalispell Fire Department was not able to meet the national response standards or national response time standards. This is a potential issue the McKinney Fire Department will experience with the Trinity Falls Development and the BFD with Phase II.

The identified issue of slower response times or failure to meet national standards for response could be addressed by BFD in several ways. One of the potential solutions is the use of automatic aid with neighboring departments. The USFA in the 2007 Topical Report describes automatic fire aid as “informal and formal relationships between fire departments to offer assistance at incidents or areas where the local fire department is lacking resources” (USFA, 2007, p. 6). Mullins (2006) in his EFO paper, researched automatic aid and mutual aid as resources to meet the Eureka, Missouri Fire Protection District needs. Mullins found that using an automatic aid agreement with surrounding cities increases the resources and capabilities to increase an effective and safe response.

Another solution for paid on-call fire departments to meet national standards on response and response times is adding duty crews. Duty crews supplement paid on-call fire departments during staffing shortages typically during the day. A recent report in the Minneapolis Star Tribune stated, “The balancing act between personal and work commitments is becoming more of an issue for suburbs that rely on volunteers” (Xiong, 2007, ¶ 4). In Roseville, Minnesota

response times dropped from six minutes to three minutes once they started a twenty-four hour duty crew program (Xiong, 2007).

BFD currently uses a duty crew program at two stations Monday through Friday from 8:00 am to 5:00 pm. This program has reduced response times and supplemented staffing shortages during the day. The BFD Duty Crew consists of a three person engine crew and the Department draws the crews from within its membership.

BFD has implemented automatic aid with neighboring cities. The cities of Eden Prairie, Edina, Richfield, and MSP Airport Fire respond to working incidents within Bloomington depending on location with one staffed engine company. The BFD also responds to those cities using the same plan. MSP Airport Fire currently responds to the MOA on automatic aid for a report of fire.

Procedures

The purpose of this applied research project was to identify needed improvements to BFD fire operations relative to the MOA Phase II expansion. The procedures used to accomplish this purpose included the following:

1. A review of literature pertaining to impacts on fire department operations related to large shopping malls.
2. An interview with Inspector Dennis Brittle, a fire inspector with the Edmonton Fire Department in Edmonton, Alberta.
3. Reviewing other fire department operations that protect large shopping malls.

4. A review of current and past impacts on the BFD from the current MOA.

The author completed a review of applicable literature from material found at the National Fire Academy Learning Resource Center and internet search engines including Google Search and Yahoo Search. The material found is related to fire department operations and large shopping malls. The literature was somewhat limited or out-of-date due to a lack of larger “megamall” shopping centers in the United States or lack of specific past incidents within these malls.

This author conducted a phone interview with Inspector Brittle on October 25, 2007. The intent of this interview was to gain information about the West Edmonton Mall in Edmonton, Alberta, Canada. As the West Edmonton Mall is similar to the MOA in size and structure type the interview provided useful information on what impact the Edmonton Mall has had on the Edmonton Fire Department and their specific response plan. The interview questions included what is the size of the Edmonton Fire Department? What are the identified impacts on the fire department from the West Edmonton Mall? Does the Edmonton Fire Department have a specific response plan to the mall? Does the Edmonton Fire Department have any equipment cache(s) within the mall? Inspector Brittle’s feedback during the interview was very helpful to the author.

Finally, the author conducted a review of fire departments across North America that provide fire protection to large shopping malls. Nineteen departments were identified and contacted either by phone and/or email. A large number of these departments either didn’t respond to my questioning or could not provide any response plans or detail on how their mall impacts their fire department. The fire departments who did respond to my questions provided a response plan to their specific mall and how it has impacted their department. The author also

completed a review of applicable literature using material from within the BFD including standard operating procedures, current MOA response plans, and the BFD duty crew program.

Results

The results of this research were found from an analysis of literature and review of fire departments across the United States and Canada. This research has been somewhat mixed although this author was able to answer the research questions from the information found during this project.

During this research an interview was conducted with Inspector Dennis Brittle of the Edmonton Fire Department in Edmonton Alberta, Canada. (The questions and responses can be found in Appendix A)

Question #1: What are the capabilities of fire departments with similar sized shopping malls?

Through research this author was able to identify several departments in the United States and Canada who provide fire protection to large shopping malls.

The King of Prussia Volunteer Fire Company provides fire protection to the King of Prussia Mall in Philadelphia, Pennsylvania and has a staffing level of approximately 95 volunteer firefighters who respond out of one fire station. The King of Prussia Volunteer Fire Company responds with three engines, one ladder, one heavy rescue, and one special support vehicle. (King of Prussia Volunteer Fire Company, n.d.).

The Westbury Fire Department consisting of 150 volunteer firefighters responds out of one fire station. Unfortunately this author was unable obtain any information pertinent to their response or capabilities (Westbury Fire Department, n.d.).

The Sunrise Fire Department in Sunrise, Florida consists of a fulltime fire department with five ALS engines and one ALS ladder. The rigs operate out of five stations and provide fire protection to the Sawgrass Mall. The Sunrise Fire Department has an operations plan for the Sawgrass Mall that includes tactical information and objectives related to their fire response involving the Sawgrass Mall (City of Sunrise, n.d.).

The Houston Fire Department provides fire protection to the Galleria shopping mall in Houston, Texas. The Houston Fire Department operates out of ninety fire stations with approximately 3,700 firefighters. The Houston Fire Department has a high-rise survey and tactical evaluation plan in place for the Galleria shopping mall (Houston Fire Department, n.d.).

The final department was the Edmonton Fire Department in Edmonton, Alberta, Canada which provides fire protection to the largest mall in North America, West Edmonton Mall. The Edmonton Fire Department consists of 900 firefighters who operate out of twenty-five fire stations.

Question #2: What are the fire operations plans for similar sized shopping malls by fire departments?

This author found this research question the most difficult to answer due to the departments who either did not have an operations plan or could not provide one for this research. It was not for a lack of large shopping malls in the United States and Canada as the author was able to identify nineteen different large shopping malls that contained at least two

million square feet of leaseable space (Eastern Connecticut State University, 2006). This author was able to identify three fire departments that have a response plan specific for their mall. These departments include the Sunrise Fire Department, the Houston Fire Department and the Edmonton Fire Department.

The Sunrise Fire Department responds to the Sawgrass Mall with an operations plan in place which includes a specific alarm assignment to the anchor stores and the mall itself. The plan includes specific rig assignments to different types of calls including false fire alarms to an automatic 2nd alarm upgrade for any confirmed fire in the mall or anchor stores. The plan also includes tactical considerations from fighting fires from an offensive to defensive position and objectives for any incident within the mall.

The Houston Fire Department's response to the Galleria shopping mall includes a "Tactical Evaluation Plan" with information on standpipes, sprinklers, fire pumps, and any unusual hazard. The high-rise portion of the mall also includes a "high-rise survey" including pertinent information regarding the building.

The Edmonton Fire Department provides fire response to the West Edmonton Mall which includes the standard response to any structure fire of three engines, one ladder, one heavy rescue company and one chief officer. If the call is to the hotel portion of the mall it will include an additional two ladder companies in the response due to the potential life hazard. Three fire stations are located within twelve blocks of the mall. The Edmonton Fire Department does not have any other specific response plan to the mall outside of regular department standard operating procedures. The biggest challenge to the Edmonton Fire Department is the hotel portion of the mall which consists of a 24-hour operation. Like the MOA the West Edmonton Mall was constructed with a state of the art fire protection system and smoke removal system

Question #3: Where are the potential locations for equipment cache(s) within the mall?

While researching this question this author could not find, through literature or contacts to different fire departments any department having equipment cache(s) within their malls. The only fire department to have an equipment cache of any kind was the BFD which stored two mass casualty trailers strategically located in two different sub-level portions of the MOA. These trailers included stock piles of stretchers and medical equipment to be used during a large mass casualty event. These trailers were a joint effort between BFD, the Bloomington Police Department, MOA, and the local paramedic service.

Question #4: What recommendations will be implemented to improve the BFD fire operations due to the Phase II expansion?

This author has found valuable information from researching other departments during this project. This research will help suggest recommendations to improve BFD operations related to the Phase II expansion.

A review of current BFD standard operating procedures related to MOA and additions to those operating procedures to cover Phase II will be necessary. These procedures include tactical objectives during an incident within the Mall, a risk management plan, communications plan, and most importantly the response plan to Phase II. The Sunrise Fire Department and Houston Fire Department have similar plans for their respective malls; information obtained from these two departments will help form an overall response plan to Phase II.

Maintaining the current BFD staffing levels will be important as Phase II is completed. Once construction begins, adding an additional duty crew to the nearby BFD station is a

possibility. The addition of one duty crew will cost the Department approximately \$125,000 per year (City of Bloomington, n.d.).

Expansion of the current auto aid agreements with other cities that surround the City of Bloomington is another possibility. Currently, the MSP Airport Fire Department which borders the MOA responds on automatic aid to the MOA. Adding additional crews from the Richfield Fire Department, Eagan Fire Department, and Minneapolis Fire Department may be feasible.

Discussion

Out of nineteen large shopping malls with at least two million square feet of leasable space in the United States and Canada this author could only identify four fire departments including the BFD who could provide an operations plan for their mall or impacts on their department directly related to their mall. Although this research was limited this author believes it will be quite valuable to BFD when planning for Phase II.

Valuable information was obtained from several departments. This author found West Edmonton Mall has not had the impact on the Edmonton Fire Department one might think, as the Edmonton Fire Department consists of 900 firefighters which lessens the impact the much smaller BFD could experience once Phase II is complete. The Sawgrass Mall in Sunrise, Florida may be more comparable as the Sunrise Fire Department's size is similar to BFD although the Sunrise Fire Department consists of a fulltime fire department. The Galleria shopping mall in Houston Texas has little impact on the Houston Fire Department as the Houston Fire Department is a fulltime department with 3,700 firefighters.

The two volunteer departments this author did make contact with who protect large shopping malls are the King of Prussia Fire Department and the Westbury Fire Department. The King of Prussia Fire Department responds to the King of Prussia Mall but could not provide any information for this research due to security reasons. The Westbury Fire Department responds to the Roosevelt Field Mall and could not provide information regarding the impacts from the mall or plans as this information was outdated.

This author believes the BFD has the information needed to solve the problem stated in this research. Solutions can be found from different departments experiencing problems with large shopping malls or other large development. The BFD will look to past experience when the MOA opened and how it impacted the fire department operations.

Recommendations

Based on the research done for this project there are five recommendations. First, the construction of Phase II could have an impact on the BFD budget. The BFD should prepare for this increase due to the expanded use of its duty crew program and an increase in call load. BFD currently averages 36 calls per year to the MOA, not a significant impact, although the potential exists for an increase during construction and once it is completed.

Second, the BFD training program will need to prepare for the different aspects of Phase II as the Department did in 1992 when MOA Phase I opened. Prior to 1992, BFD had not responded to amusement park, let alone an indoor amusement park. New structures including parking structures, an indoor water park, on site power plant and a new fire suppression system will only be a few of the topics that will need to be covered with every member of the BFD and

mutual aid partners. The BFD and the Bloomington Police Department have done extensive training at the MOA on mass casualty incidents including possible terrorist events. This training has influenced the operation plans for both departments. Training will be important for a successful outcome to an all hazard event.

Third, expanding/replacing BFD Station #3 and determine if it needs to be located in a more strategic location. Moving BFD Station #3 near Phase II is an option but this option would cause potential problems with the paid on-call format the Department currently operates. A station near Phase II may be counter-productive unless it is staffed 24 hours a day. Building a new BFD Station #3 or expanding the current station is a potential option that would allow for more apparatus space placing more vehicles and special equipment intended for the MOA. This would allow the equipment to be placed within a few blocks of the MOA.

Fourth, start another duty crew and enhance mutual aid through automatic aid agreements with neighboring departments is vital. Adding another duty crew engine to the city at BFD Station #3 will be essential. A potential start date for this additional duty crew engine would be once Phase II construction starts. This action will have an affect on the fire department budget but planning for this will make the transition easier. With the additional duty crew at Station #3, it is expected to enhance the overall daytime response to the MOA and result in lower response times. Hours for this additional duty crew will have to be determined as the current duty crew system works 8:00 am to 5:00 pm. With Phase II, the hotel portion will provide a 24-hour operation whereas the current MOA closes by 10:00 pm. Also, enhancing the automatic aid agreements with neighboring fire departments will provide more resources if an event of substantial proportion were to occur.

Fifth, the BFD recognizes the potential for large loss of life and property if an event was to occur at the MOA. For this reason operations and planning have been adjusted to deal with such an event. To deal with these events the BFD will need to examine alternatives to the existing response. One idea will be placing additional trailers inside Phase II which may include EMS equipment and fire department equipment such as fire extinguishers, high rise hose bundles, forcible entry tools, additional SCBA bottles, and salvage and overhaul tools. With this amount of equipment it will be important to provide transportation for fire personnel once they enter Phase II. This could be done with electric carts or other electric motorized vehicles able to haul firefighters and equipment. The placement of these vehicles could include fire pump rooms, loading dock areas, or other strategically located areas easily accessible to the Department.

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Appendix A.....Inspector Brittle Interview

Interview of Inspector Dennis Brittle
Edmonton Fire Department
Edmonton, Alberta, Canada.

This interview took place by phone on October 25, 2007

Questions/Responses

1. What is your name and rank position on the Edmonton Fire Department?

Response: My name is Dennis Brittle, assigned to the inspections division of the Edmonton Fire Department as an Inspector.

2. Can you tell me about the Edmonton Fire Department?

Response: The Edmonton Fire Department consists of 900 firefighter who operate out of 25 stations. The Edmonton Fire Department is part of the emergency services division which consists of fire and emergency medical services.

3. Is the West Edmonton Mall in the jurisdiction of the Edmonton Fire Department?

Response: Yes, the West Edmonton Mall falls within our jurisdiction as far as response and inspections.

4. Does the fire department respond to medicals either as first responders or for advanced life support?

Response: The fire department and emergency medical services are in the same emergency services division but the fire department only serves as a back-up to the emergency services division.

5. Can you tell me about the West Edmonton Mall and what impact it has had on the Edmonton Fire Department?

Response: The West Edmonton Mall hasn't had significant impact on the Edmonton Fire Department. Keep in mind the Edmonton Fire Department consists of 900 firefighters and 25 stations with three stations within twelve blocks of the mall. The biggest impact would be the inspections division. The West Edmonton Mall has a fire protection system with 13 different sprinkler systems, several fire pumps, and a state of the art smoke removal system.

6. Has the Edmonton Fire Department responded to any significant incidents within the West Edmonton Mall?

Response: We have had several fires in the mall but nothing significant. The fires we have had all been contained by the fire suppression system.

7. How many fires have you had in the mall?

Response: I'm not sure the total number since the mall opened but in the past two years we have had five fires. The last fire being the most significant because it involved an electrical transformer causing more smoke issues than fire.

8. Does the Edmonton Fire Department keep any equipment cache inside the mall?

Response: No we don't.

9. Has the West Edmonton Mall changed your department's response when responding to this structure?

Response: Somewhat, we send the normal three engines, one ladder, one heavy rescue, and one chief to any response within the mall. If the response is to the Hotel portion we send an additional two ladder companies.

10. What has been the biggest challenge for the Edmonton Fire Department in regards to the West Edmonton Mall?

Response: The biggest challenge is the inspections portion, keeping the mall up to code and getting the mall to abide by the fire code. Another big challenge is the hotel portion of the mall which turns the mall into a twenty four hour operation. We have a life hazard in the mall 24 hours a day.